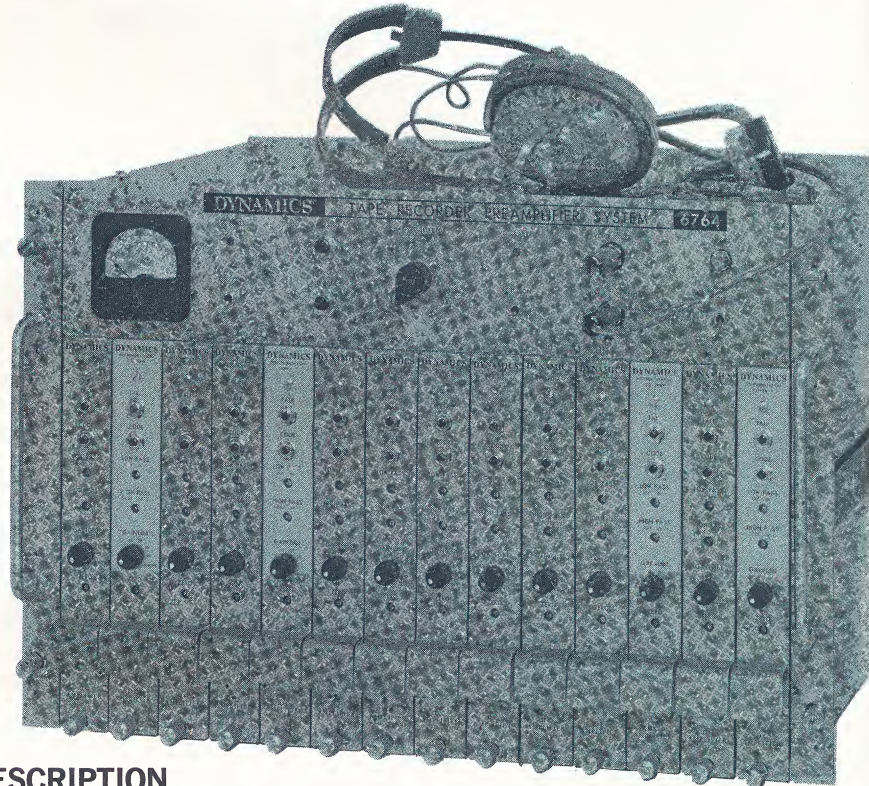


DYNAMICS™

Fourteen channel
TAPE RECORDER
PREAMPLIFIER SYSTEM
Model 6764

PRODUCT
DATA
855-1

- ☐ dc-300 kc
- ☐ voice and test circuits
- ☐ complete remote and local controls
- ☐ integral power supply for each amplifier

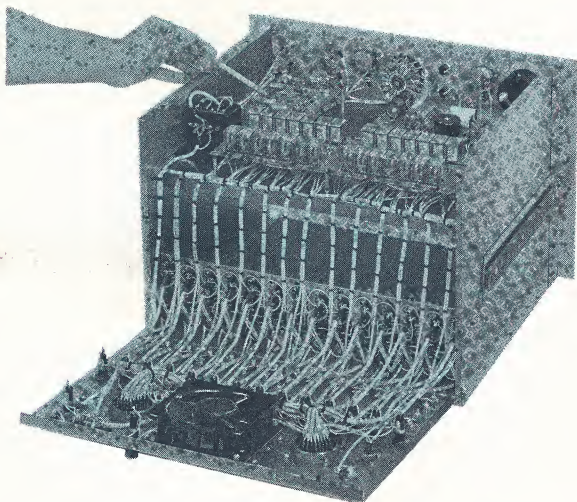


DESCRIPTION

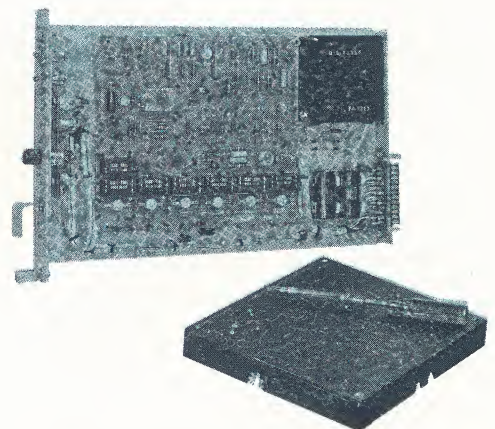
Fourteen wide-band dc amplifier channels are provided in a single rack-mounting cabinet, together with a 400 cps local oscillator, a voice amplifier and a headset. Gain changing, test functions, voice recording or monitoring can be handled locally and remotely.

Typical Amplifier Specifications:

300 kc bandwidth, output capability ± 5 volts and ± 5 milliamperes, gain steps from -20 to $+40$ db, integral power supplies, high pass and low pass filter switches.



Rear view showing remote/local provisions, rear panel connectors and blower.



A single amplifier channel. Internal shield removed to show gain changing relays and integral power supply.

SPECIFICATIONS

INDIVIDUAL AMPLIFIER

Voltage Gain	Steps of -20, -10, 0, 10, 20, 30, 40 db. Front panel switch operates internal reed relays. Gains can be remotely selected.
Gain Accuracy	$\pm 1\%$.
Gain Stability	$\pm 0.1\%$.
Distortion	Less than 1%, dc to 100 kc, 5% to 300 kc.
Input Impedance	100 k ohms.
Output Impedance	50 ohms, or less, dc to 300 kc (47 ohms in series with output).
Capacitive Loading	0.1 μ f, or less, will not cause instability.
Output Voltage	± 5 volts.
Output Current	± 5 milliamperes.
Overload Recovery	200 microseconds to 0.01% of final value.
Zero	Recessed control provides ± 150 mv minimum offset referred to output.
Crosstalk	Less than the noise for one channel, all other channels operating at full scale output.
Drift	$\pm 10 \mu$ v, referred to input, or ± 2 millivolts referred to output, whichever is greater, at constant temperature.
Temperature Coefficient of Drift	$\pm 2 \mu$ v/ $^{\circ}$ C, referred to input, or ± 2 mv/ $^{\circ}$ C, referred to output, whichever is greater.
Noise	3 mv rms, or less, referred to the output in a 300 kc bandwidth measured at gain 100.
Intermodulation	None.
Frequency Response	± 0.5 db, or less, dc to 300 kc without filter in.
High-Pass Filter	Switch provides 30 cps cut-off at 6 db/octave.
Low-Pass Filter	Switch provides 20 kc cut-off at 6 db/octave.
Slewing Rate	10 volts/ μ sec.
Isolation	Fully insulated plug-in module. No cross-channel connections or channel-to-cabinet connections.

Isolation (cont.) Double-shielded power transformer. 5 pf, or less, of unguarded leakage capacitance to power ground.

SYSTEM

Sine Wave Oscillator:

Frequency	400 cps ± 10 cps.
Output Voltage	1 v rms. Adjustable to 1 v ± 0.01 v rms by front panel indicator. Remote or local substitution into data channels.

Voice Amplifier and Monitoring Circuits:

Voltage Gain	70 db maximum. Variable gain control is provided on the front panel.
Output	1 v rms into 600 ohms. Remote or local substitution into data channels.

Physical Dimensions Mounts in standard 19-inch relay rack, 14-inches high, and 15-inches deep.

Front Panel Controls 1. Channel selector switch.
2. Headset connectors.
3. Voice Amplifier LEVEL control.
4. 400 cps Oscillator LEVEL control.
5. 400 cps Oscillator LEVEL indicator.
6. ALL CODE, ALL TALK pushbutton switches.
7. Power switch (system) and ON lamp.
8. Power switches for voice amplifier and 400 cps oscillator.

Power Supply Integral with each amplifier.

Power 105-130 volts, 60 cps, 130 volt-amperes.

Relay Power 24 vdc externally supplied.

Fuses Provided in cabinet.

Operating Environment Temperature, 0 $^{\circ}$ C to 50 $^{\circ}$ C.

PRICE

Model 6764 14 Channel Tape Recorder
Preamplifier System \$9,780.00

Price is f.o.b. Monterey Park, California. Terms: net 30 days.


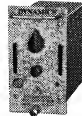


NOTE



A wide variety of standard and special instruments are available. Information concerning specific applications is available upon request.

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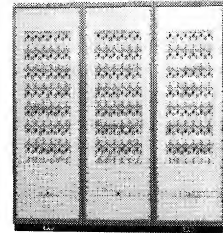
If you're thinking of **INSTRUMENTATION**——
 think of **DYNAMICS**[™] (... *that's our middle name.*)
 INSTRUMENTATION COMPANY


We make **DC AMPLIFIERS:** Differential  and Single-ended  ;
 also **AC AMPLIFIERS:** Charge  and Voltage  . We make 'em

narrow  ... tall  ... and small  .

In single  channels, or by the room-full

Five abreast, or 6, or 7, or 8, or 10, or 12 ... even 14!



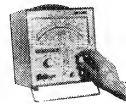
We make  **ELECTRONIC FILTERS:** Chebyshev,
 Butterworth, Linear Phase; 3rd to 6th order; combinations & specials.

And we make **TAPE RECORDER MONITORS**  ; **BRIDGE POWER SUPPLIES;** and  **GALVANOMETER CONDITIONING UNITS.**

■ *Fact is, we make just about everything between transducer and recorder.*

... we also make **BASIC MEASURING INSTRUMENTS:**

DC Millivoltmeters ,

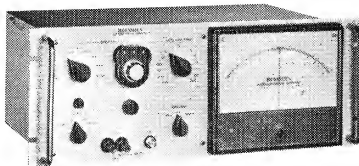


DC-AC Millivoltmeters,

DC Microvoltmeters , DC Microvolt-Ammeters



and



DC Micromultimeters.

Send for free
 Technical Booklets:

"Shielding and Ground-
 ing for Instrumentation
 Systems,"

and

"Selecting a
 Differential
 Amplifier."

We'll include
 a current list
 of other titles.



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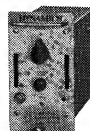
INSTRUMENTATION COMPANY

Excellence

Differential DC Amplifiers

The Dynamics philosophy in differential amplifier design assures excellent performance under adverse system conditions. A wide range of solid-state units provide applicability to every instrumentation situation where differential amplifiers are indicated.

Features include: bandwidths up to 1 megacycle; low drift; high common-mode voltage levels; gains up to 3000; high input impedance; operation from high source impedances; and low noise referred to input.



MODEL 7575 One megacycle bandwidth. Gains to 1250. 100 V p-p CM level. Filter options available.
— from \$835.00

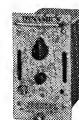


MODEL 7504 Universal buffer amplifier. Floating source operation. FET circuitry.
— from \$235.00

MODEL 6450 300 V p-p CM level. Floating sources permitted.
TC < 0.2 μ V/°C.
— from \$685.00



MODEL 6996 100 kc bandwidth. High source impedance operation. 0° to 50°C operating temperature range.
— from \$635.00



Single-Ended DC Amplifiers

All instrumentation packages are isolated from cabinet grounds. Each amplifier has an integral power supply and double-shielded power transformer, and can be connected single- or double-wire shielded to input and/or output.



MODEL 6759 300 kc bandwidth. Gains to 1000. 20 V/ μ sec slew rate.
— from \$600.00

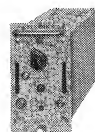


MODEL 6700 Galvanometer driver. 30 kc response. ± 100 ma output.
— from \$340.00

AC Voltage Amplifiers

All-solid-state amplifiers ideal for piezo-electric transducers feature input impedances up to 300 megohms, bandwidths from 0.6 cps to 200 kc, plug-in filters, and gains to 1000.

MODEL 7383 Bandwidth: 0.7 cps to 100 kc. Phase coherence $\pm 3^\circ$.
— from \$600.00



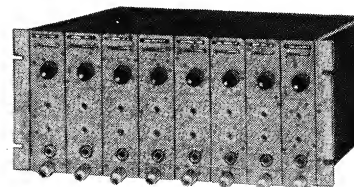
Model 7383 AC Voltage Amplifier in single-channel cabinet Model 7904/DQ.



AC Charge Amplifiers

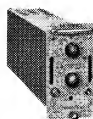
Charge amplifiers permit gains to be independent of input cable lengths. Dynamics units also have output capability for driving long transmission lines. Many local/remote calibration options are available.

MODEL 7302 Shown 8 abreast in 19" rack-adaptor cabinet. 0.008 pC rms noise. 0.2 to 500 g sensitivity range FS. FET circuitry. Integral power supply.
— from \$615.00

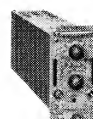


Electronic Filters

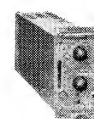
Dynamics has low- and high-pass filters from 1 cps to 100 kc, 3rd to 6th order. Low-pass units include Butterworth, Chebyshev and Linear Phase types. Features: low dc drift; independence from source or load impedances; long line driving capability; no insertion loss; and variable frequency in 0.1 decade steps, over a 3 decade range.



MODEL 6360-H6 High-pass, 6th order filter. Cut-off frequencies from 1 cps to 1 kc.
Price \$1,030.00



MODEL 6370-L6 Linear Phase, 6th order, low pass filter. Cut-off frequencies from 10 cps to 10 kc.
Price \$990.00



MODEL 6371-S6 Linear Phase or Butterworth low-pass, 6th order filter.
Price \$1,140.00

Galvanometer Conditioning Units

These units offer variable attenuation/matching between a wide range of sources and up to 12 recording galvanometers. Current ranges are from microamperes to hundreds of milliamperes. Front-panel, continuous adjustments allow setting of any desired full scale.

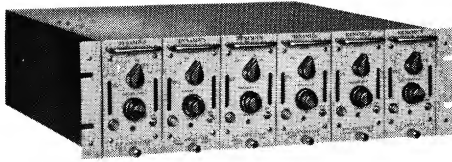


MODEL 301/PD 6-channel control unit, with signal-shield integrity maintained for each channel.
Price \$625.00



MODEL 301/PE 12-channel control unit.
Price \$960.00

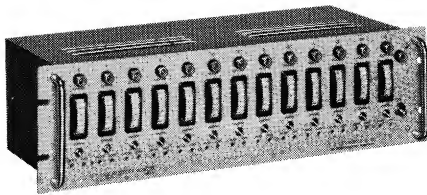
In Instrumentation



MODEL 7705 Current or voltage regulation. Plug-in conditioning, calibration and balancing cards offer maximum versatility.
— from \$250.00

Strain-Gage Power Supplies

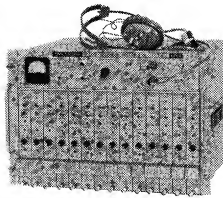
These power supplies are designed for exciting strain-gage bridges. They are regulated, triple-shielded and fully floating. Provisions for calibration, bridge monitoring and balancing of from 4- to 8-wire systems are provided on the front panel.



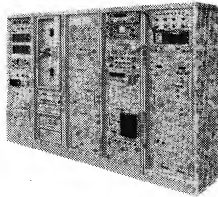
MODEL 4995 13-channel monitor. 1.7 cps to 30 kc bandwidth.
Price \$2,170.00

Multi-Channel Tape Recorder Monitors

Simultaneous monitoring of up to 13 data channels is provided by the Dynamics Model 4995. Individual panel meters monitor each channel up to 1 volt rms in the frequency band from 2 cps to 10 kc; neon lamps indicate signals in excess of 1 volt rms.

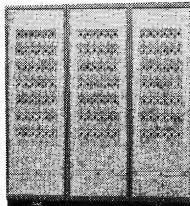


MODEL 6764 14-channel Tape Recorder Preamplifier System. 300 kc bandwidth. Local and remote voice recording and calibration.
Price \$9,780.00



Ground Support Instrumentation Console comprising Differential DC and Piezoelectric Amplifiers, and Strain-Gage conditioners.

Typical system used for deep space data acquisition.



Systems Capability

Dynamics has extensive systems capability in static and dynamic testing; high-speed data acquisition and handling; monitoring, recording and control.

In-depth, low-level circuit experience has evolved shielding and isolation techniques which assure freedom from ground-loops and cross-talk.

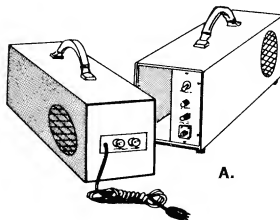
Dynamics equipment has performed successfully in both space-borne and ground support applications for all the major NASA programs.

Enclosures and Mounting Options

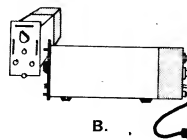
A. Single-channel cabinets have forced-air ventilation and front-panel connectors. Each has a leather handle, line cord and 3-prong connector.

B. Low-priced Adaptor Kit includes easy-to-attach plastic feet and cord-connector; converts amplifiers into practical bench units.

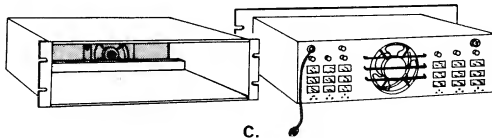
C. Standard-rack adaptor cabinets are available for multi-channel installations. They are all-stainless-steel, with generous forced-air ventilation. Rear connectors of solder-, TNC, BNC and special types are available. Dural trim strips of baked enamel match instrument panels.



A.



B.



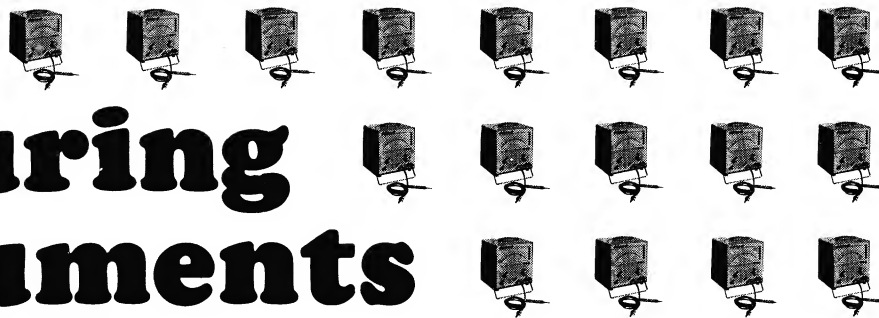
C.

NOTE — These instruments represent only a fraction of the Dynamics line. Literally hundreds of models — of standard and custom design — are available. We welcome the opportunity to help solve any of your instrumentation problems.

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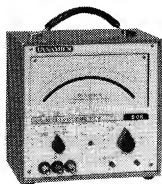
Basic Measuring Instruments



DYNAMICS DESIGNED — *with the engineer in mind.*

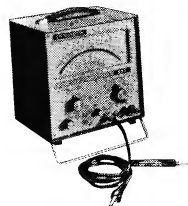
Dynamics' basic design eliminates common measurement problems: ☐ **Power line effects.** Double-shielding techniques prevent the flow of 60 cps reactive current in the device being measured. ☐ **Modulation errors.** Modulation is non-synchronous with the main power frequencies. Any synchronous ac information contained in dc signals is not demodulated and cannot contaminate readings by appearing as a dc component. ☐ **Common-mode difficulties** can be for-

gotten because of Dynamics box-within-a-box construction, internal power sources and double-shielding techniques. Instruments may be used above ground potential without difficulty. ☐ **Loading effects.** Probe isolating resistors and wide-band input stages essentially eliminate capacitance loading, and — unlike many null-measuring devices — input impedance is high over a wide frequency range.



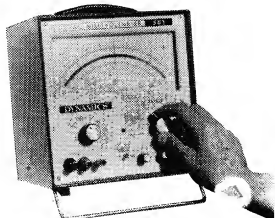
MODEL 506
DC Millivoltmeter
\$295.00

This rugged, low-level dc millivoltmeter is completely portable; uses 4 flashlight (D) cells with 1000-hour minimum operating life. The $\pm 1\%$ accurate Weston meter has a BIG 7.2" mirror-backed, zero-center scale, and taut-band suspension. Eleven voltage ranges from ± 10 mV to ± 1000 V FS. Input impedance is 100 megohms on the 3 V and higher ranges, 10 megohms on lower ranges.



MODEL 503
DC Microvolt-Ammeter
\$625.00

This solid-state microvolt-ammeter operates from line or automatically-recharged internal power source (minimum of 24 hours "un-plugged" use). Ideal when "lab" accuracy is needed for field and/or portable use. Absence of high voltage assures safety in hazardous areas. Fifteen ranges: ± 100 μ V to ± 1 kV, ± 100 nA to ± 1 A. Outstanding overload protection; tolerates 1000 volts on the 1 V range.

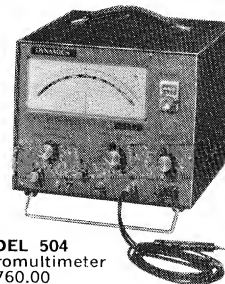


MODEL 501
DC-AC PORTABLE
Millivoltmeter
\$395.00

- Both DC and AC Millivoltmeter in one portable instrument
- Output for scope or recorder
- Center zero for DC readings, left zero for AC
- $\pm 1\%$ accuracy for DC, $\pm 2\%$ for AC
- dBm scale included
- Front panel control for meter damping

Now, for the *first time*, *both* AC and DC voltage measurements in a portable instrument of genuine laboratory quality. Operates for 500 hours on 6 D cells. Thirteen ranges of DC measurement from ± 1 mV to ± 1 kV with $\pm 1\%$ accuracy FS; 12 ranges of AC measurement from ± 1 mV to ± 300 V, down to 5 cps. A dBm scale is included and calibrated so that 0 db is 1 mW in 600 Ω . Big, easy-to-read 7.2", mirror-scale, taut band meter.

The Model 504 solid-state micromultimeter measures microvolts-ohms-microamperes on the same big 7.2" meter used throughout the Dynamics basic measuring instrument line. Automatically-recharged internal power source allows complete isolation from the power line and operation in areas remote from line power, for a minimum of 24 hours. Electrical specifications are similar to Model 503 (above) with the addition of 8 resistance bridge ranges from 10 Ω to 100 megohms.



MODEL 504
DC Micromultimeter
\$760.00

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